

Intentional Replantation of a Periodontally Involved Hopeless Molar Tooth: Results of 3-year Follow-up: A Case Report

Periodontal Tutulumlu Ümitsiz Molar Dişte Maksatlı Replantasyon Uygulaması. 3 Yıllık Takip Sonuçları: Bir Olgu Bildirimi

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ABSTRACT

Intentional replantation is a treatment option when more conventional forms of treatment either fail or are impossible. This article presents an intentional replantation of a periodontally involved hopeless mandibular molar tooth with 3 years of results. Mandibular right first molar had deep periodontal pockets, class III furcation involvement, suppuration, class III mobility and radiographically wide radiolucency around roots. Tooth was replanted after Tetracycline-HCl conditioning. At the end of 3 years tooth was asymptomatic and still in function with no radiographic signs of pathosis. Periodontal health was in normal limits with no bleeding on probing and no pathological pocket formation. The results obtained with this tooth may indicate a viable mode of treatment in certain situations to preserve the natural dentition with intentional replantation for periodontally involved hopeless teeth.

ÖZET

Geleneksel tedavi yöntemlerinin başarısızlığa uğradığı veya imkansız olduğu durumlarda planlanmış replantasyon bir tedavi seçeneğidir. Bu vaka raporu periodontal olarak hasta olan, ümit vadetmeyen mandibular molar dişe yapılan planlanmış replantasyon tedavisinin 3 yıllık sonuçlarını göstermektedir. Mandibular sağ 1.moların derin periodontal cepleri, sınıf 3 furkasyon tutulumu, süpürasyonu, 3.derece mobilitesi ve radyografik olarak köklerin çevresinde geniş radyolüsenesi vardır. Bu dişin tedavisi için planlanmış replantasyon işlemi yapılmıştır. 3 yılın sonunda diş asemptomatik olup radyografik olarak herhangi bir patoloji göstermeden hala fonksiyon göstermektedir. Dişte sondlamada kanama ve periodontal cep görülmemektedir, periodontal sağlık normal limitlerdedir. Bu diş ile elde edilen sonuçlar belirli koşullarda doğal dentisyonu korumak için, periodontal olarak hastalıklı ümitsiz dişlerin planlı replantasyonunun alternatif bir tedavi metodu olabileceğini göstermektedir.

KEYWORDS

Intentional replantation, Periodontal diseases/treatment, Tetracycline-HCl/therapeutic use, Bone loss/surgery, Furcation involvement

ANAHTAR KELİMELER

Maksatlı replantasyon, Periodontal hastalık/tedavi, Tetrasiklin-HCl/teröpatik kullanım, Kemik kaybı/ cerrahisi, Furkasyon tutulumu

INTRODUCTION

Intentional replantation involves the purposeful removal of a tooth and its reinsertation into the socket after proper endodontic manipulation and repair^{1,2}. Intentional replantation is a treatment option when more conventional forms of treatment either fail or are impossible³. Generally it is thought that it may be considered as a viable mode of treatment in certain situations to preserve the natural dentition⁴.

Intentional replantation is contraindicated in the presence of periodontal disease in which there is marked tooth mobility, furcation involvement or gingival inflammation². A replantation will have a lower success rate if the tooth is already compromised periodontally and missing the interseptal bone⁵. Although most of the authors revealed periodontal involvement as a contraindication for replantation, there are some studies with successful results with periodontally involved teeth^{6,7}. Lu, replanted a periodontally involved and endodontically mistreated mandibular first premolar and reported that replanted tooth remained functional and asymptomatic for 32 months⁶. In our previous study we have replanted periodontally involved hopeless teeth with class 3 mobility, more than 50% bone loss and deep pockets after tetracycline-HCl treatment. Treatment was resulted in bone gain and a reduction in pocket depth⁷.

In this case report, periodontally involved mandibular right first molar tooth was treated with intentional replantation and the result of 36 months is presented.

CASE PRESENTATION

A 58-year-old Caucasian male patient was referred to Hacettepe University, Faculty of Dentistry for treatment. His main concern was pain and discomfort on the right mandibular arch. Medical history was essentially noncontributory. Intraoral examination revealed good oral hygiene, few cavities and generalized moderate attachment loss on the mandibular arch and also he was missing mandibular right second molar

tooth. He was edentulous on the maxillary arch. Mandibular right first molar had deep periodontal pockets (on the buccal side from mesial to distal; 4 – 7 – 9, on the lingual side from mesial to distal; 5 – 7 – 8), class III furcation involvement⁸, suppuration, bleeding on probing and class III mobility⁹. His pain and discomfort was resulting from this area. Radiographically there was a wide radiolucency around mandibular right first molar area (Fig 1). Vitality test revealed that the tooth was devital. A partial denture or an implant therapy after the extraction of mandibular first molar tooth was suggested. However, he rejected and wanted to keep the tooth by any means. A treatment plan called intentional replantation was presented and described to the patient and he wanted to try the treatment with an understanding that the tooth still might not survive. The patient was first sent to an endodontist to have the tooth re-evaluated. Due to the excessive mobility they suggested to finish the root canal therapy during the replantation procedure after having it extracted. During the replantation procedure, tooth was gently extracted as atraumatically as possible. After extraction, tooth was placed on a sterilized moistured sponge. The socket was not curetted but the granulation tissue at the bottom of the socket was removed and rinsed gently with sterile saline solution. The epithelial lining of the pocket was gently scraped with gracey curettes. During this procedure root canal therapy was



FIGURE 1

Radiographic view of the mandibular right first molar before replantation. Note the furcation involvement and wide radiolucency around both roots.

done by an endodontist. Further, the root surfaces were scaled and planned. All granulation tissues, calculus, necrotic cementum and affected periodontal ligament were removed using hand instruments. Fresh Tetracycline-HCl (100mg/ml) (Boehringer Mannheim, Germany) applied for 5 minutes to the root surfaces with sterile cotton pellets after filtering with 0.45 µm Millipore filter (Millipore Corp, MA, USA). Following tetracycline-HCl conditioning, root surfaces were rinsed with sterile distilled water for 1 min. Tooth was then replaced into the socket. No management was done to the apex of the teeth. The patient was wearing a complete denture on the maxillary arch. It was thought that the force during mastication would not be too strong and harmful for the replanted tooth so no adjustment was performed to the occlusal plane of the tooth. It was stabilized by 3-0 silk suture over the occlusal surface of tooth. The time interval between extraction and subsequent replantation of tooth did not exceed 20min as suggested before¹⁰⁻¹².

Patient was prescribed Doxycycline 100 mg once a day for one week and also recommended to continue his routine oral hygiene attempts. He was instructed to avoid using the treated side for mastication for 3 weeks. He was first examined at day 7 and the sutures were removed 2 weeks after surgery. Tooth in the replantation site was polished on the third week after replantation and the patient was placed in a maintenance recall program for every 2 months.

The tooth was relatively firm and asymptomatic in the first 6 months. There was no bleeding on probing. The pockets depths were on the buccal side from mesial to distal 4 – 4 – 4 mm and on the lingual side from mesial to distal 3 – 4 – 4 mm. He was able to use the tooth in normal manner although he paid a special attention not to chew hard food by that arch. It was determined that the replanted tooth had class I mobility. In the sixteenth month the radiolucent area had diminished remarkably. However, there was still a small area of radiolucency around the coronal third of the distal root at both sides (Fig 2). Tooth

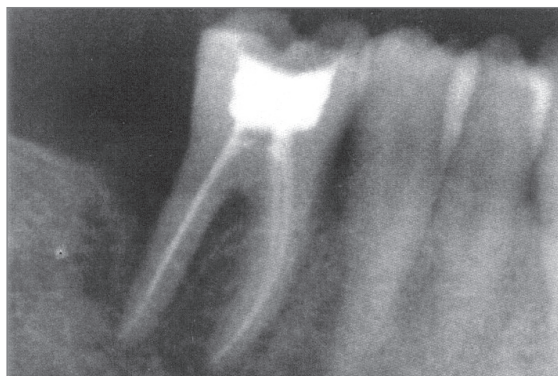


FIGURE 2

Radiographic view of the mandibular right first molar 16 months after replantation. Note the remarkably diminished radiolucency around both roots remaining a small area of radiolucency around the coronal third of the distal root at both sides. No evidence of external root resorption.

was firm and still asymptomatic. Class I mobility was still remaining. The pockets depths were on the buccal side from mesial to distal 3 – 4 – 4 mm and on the lingual side from mesial to distal 3 – 4 – 4 mm. Periodontal health was in normal limits with no bleeding on probing. Plaque control of the patient was excellent. He reported that he could chew normally on that side. A regular periodontal maintenance therapy was performed that consisted of scaling and polishing. The replanted tooth was still in the mouth and in function after 36 months. The radiolucency had diminished almost totally remaining a little area only at the distal side of the distal root (Fig 3).



FIGURE 3

Radiographic view of the mandibular right first molar 36 months after replantation. Radiolucency had diminished almost totally remaining a little area only at the distal side of the distal root. No sign of external root resorption.

The tooth had still class I mobility. The gingiva around tooth was pink, firm, in good shape and there was no bleeding on probing. The pockets depths were on the buccal side from mesial to distal 3 – 3 – 4 mm and on the lingual side from mesial to distal 3 – 3 – 4 mm. We have to emphasize again that the patient's oral hygiene was excellent; there was no plaque or calculus at all. Patient is still using the tooth and under the maintenance program.

DISCUSSION

Replantation has been performed for more than a thousand years¹⁰. Presence of periodontal disease in which there is marked tooth mobility, furcation involvement or gingival inflammation are thought to be a contraindication. However, there are some reports suggesting that it can be a successful treatment alternative for periodontally involved hopeless teeth as a last resort at least for a period of time^{6,7}.

Kaufman reported successful results of a maxillary molar tooth after 4 years follow-up period, which was treated with intentional replantation¹³. A mandibular first molar, which was replanted, by Czonstkowsky and Wallace had no signs of resorption and ankylosis after 6 months¹⁴. Different investigators reported success rates varying from % 52 to % 95 with follow-ups between 1 to 22 years in posterior teeth^{2,15-17}. Bender and Rossmann reported a success rate of 77.8 % in the molar teeth. Among 14 mandibular molars, success rate in first molars was 85.7%, and %71.4 in second molars. Of the four maxillary molars there were three first and one second molar with a failure of one maxillary first molar, with a 66.7% success rate². Raghoobar and Vissink replanted 29 teeth consisting of 2 mandibular first, 17 mandibular second, one mandibular third and 9 maxillary second molars and evaluated for an average of 62 months. The success rate was 72 % and 25 of them were still in function¹⁸.

The success rate of intentional replantation varies related to the observation period and the

success criteria. It is difficult to compare our case with other investigators since our treatment technique, and most importantly the periodontal health of the replanted tooth was completely different than the other authors. In our case the mandibular first molar tooth had class III mobility, deep periodontal pockets, class III furcation involvement and large bony defect around the roots. This tooth had no chance of treatment with conventional forms of treatment and therefore a poor to hopeless prognosis.

External root resorption is a serious complication of replantation. However, usually small areas of root resorption may not be detected on the radiographs. Since the slight external root resorption may not be detectable radiographically, the periodontal health of the tooth is more important and reliable parameter for the prognosis^{17,19,20}. Teeth with a necrotic periodontal ligament showed a high incidence of resorption and ankylosis. Denuding the root surface chemically prior to replantation of the teeth without vital periodontal membrane was suggested in order to prevent resorption²¹. Due to these reasons, diseased periodontal ligament was removed prior to replantation in this case as described before⁷. At the end of 36 months, radiographically no resorption or ankylosis was seen in our case. This could be due to either the effective elimination of necrotic periodontal membrane and/or microorganisms prior to replantation. Further, tetracycline-HCl treated root surfaces may act as a slow release reservoir for its antibacterial effect and reduce the deleterious effect of inflammatory responses. In addition to antibacterial effect, tetracycline-HCl may reduce osteoclastic bone resorption and collagenase activity by its well-known properties²²⁻²⁶.

Although the success rate is not always high, intentional replantation may be a treatment alternative that deserves consideration to maintain the natural dentition and avoid extraction of the tooth. Treating the roots with tetracycline-HCl may be considered during intentional replantation.

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